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ABSTRACT

This first part of a preliminary study considered the impact of students' gender, cognitive learning styles, and computer anxiety on students' academic achievement and performance. The sample consisted of 60 male and 80 female undergraduates enrolled in two basic/developmental mathematics courses taught by one male and one female instructor at a four-year public and religiously affiliated institution in the southeastern part of Texas. Students completed a questionnaire that focused on their perceptions of instructors' classroom attitudes and teaching effectiveness; perceived computer anxiety and attitude; and visual/global embedded figures. The study concluded that: (1) gender and computer anxiety were not significant factors and that none of the interaction effects were significant; (2) female students achieved and performed about the same as male students, although they were more likely to be more computer anxious and field-dependent and less satisfied than male students; and (3) cognitive learning styles were a significant factor. Field-dependent students had the highest marginal means for both academic achievement and performance, and were more likely to be satisfied with their course than field-neutral and field-dependent students. Appended are the survey instruments. (Contains about 132 references.) (RH)

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Effects of Gender, Cognitive Learning Styles, and Computer Anxiety on Students' Academic Achievement and Performance: A Preliminary Study I

Abstract

This preliminary study considered the impacts of students' gender, cognitive learning styles, and computer anxiety on students' academic achievement (cumulative college GPA) and performance (Criterion Referenced Test Score). The sample consisted of 140 (60 male & 80 female) volunteer developmental undergraduates enrolled in two Basic/Developmental Mathematics courses taught by two (one male[1] and one female) instructors. The majority of the sample clustered within the field-neutral cognitive learning style and moderate computer anxiety categories. None of the students at the low computer attitude group was field-dependent and, none of the students at the high computer attitude group was field-independent.

Results indicated that: (1) Gender and computer anxiety were not significant factors; and none of the interaction effects were significant. Female students achieved and performed about the same as male students; however, they were more likely to be more computer anxious and field-dependent, and less satisfied with their course than male students. (2) Cognitive learning styles was a significant factor. Field-independent students had the highest marginal means for both academic achievement (Mean 3.59, SD = 0.11) and performance (Mean = 92.77, SD = 2.26); and were more likely to be satisfied with their course than field-neutral and field-dependent students.

[1] Special thanks to Dr. T. Nelson Ikegulu for administering the instruments at the pilot site.

Effects of Gender, Cognitive Learning Styles, and Computer Anxiety on Students' Academic Achievement and Performance: A Preliminary Study I

Introduction

While microcomputers are becoming more available in the schools, a number of serious issues about implementing change in classrooms must be faced by administrators and teachers. Bentzen (1974), Goodlad (1980), Lortie (1975), and Huberman and Miles (1984) all have noted that change should be viewed as a complex process consisting of many important variables (i.e., time, clarity, credibility, the curriculum, institutional structure, and the resistance of teachers to change). Hall (1978) more specifically pointed out that a major reason for failure to implement innovation has been the inattention accorded the individual user involved in the change process. While school systems press to implement computers, teachers vary in the quality of their expertise, interest and acceptance of the new technology and seem to express a basic fear of computers. Unless the real concerns of teachers are seriously and systematically considered as a critical variable in the change process, teacher use of computers will take on the usual "hit and miss" orientation so typical of innovations that educators effectuate. For innovation to be implemented successfully, attention must be given to the personal concerns and involvement of individuals in the change profess for change occurs only as individuals change (Hall, 1978).

Learning outcomes are significantly influenced by learner's cognitive, cultural, and linguistic characteristics. This has become more imperative in today's developmental education classrooms given the culturally and ethnolinguistic diversity that impact learning and,

consequently teaching. Thus, developmental educators should be cognizant of the unique learning strategies of all students, including individual differences, culturally-bound linguistic variables, and the interrelationships among these variables with the instructors' teaching styles. In particular, ethnolinguistic and cultural differences brought to the classroom by linguistically diverse developmental students should be the axiom upon which developmental education instruction is based (Barham & Ikegulu, 1999; Ikegulu, et al., 1999). The instructional strategies should include necessary adjustments in content, emphases, curricula, and classroom activities to foster learning and stimulate recall in any mediated instructional environment (Barham & Ikegulu, 1997a, 1997b; Cross, 1976; Elliot, 1976; Livingston, 1991; Rayner, 1992).

The concepts "learning styles" and "cognitive styles of field dependence status (CSFDS)," have been operationalized in the literature as independent and contrasting modes of learning. While some studies identified learning styles as stable traits, others noted that CSFDS are the differential learning modes that afford the learners the ability to style-shift their learning styles in learning and/or instructional environments. In this study, both concepts are combined to mean "cognitive learning styles."

Learning styles are unique ways an individual gathers and processes information. Cognitive styles of field dependence status are the information processing habits that represent a learner's typical mode of thinking, perceiving, problem-solving, and remembering (Greco & McClung, 1979; Grieve & Davis, 1971; Messick, 1976, 1984; Witkin, 1979; Witkin & Goodenough, 1981; Witkin, Moore, Goodenough, & Cox, 1977; Witkin, Oltman, & Karp, 1971). These styles constitute important traits of individual differences among students and appear to

have important implications for developmental education instructors as well as in instructional designers.

The purpose of this preliminary study was to determine and compare the differential effects of gender, computer anxiety, and cognitive learning styles on students' academic achievement and performance.

Certain circumstances provide realistic motives to further one's education: "The changing roles of men and women, postponement of marriage, increase in the number of women in the work-force, higher divorce rate, unemployment, as well as the aging of America, increased leisure time, boredom, and desire to learn or to do something may cause many mature students to seek admission to universities" (Iovacchini, Hall, & Hengstler, p. 53). These situations may serve as vital forces to instigate the educational endeavor, after which other factors may become primary, secondary, or tertiary motives.

Male and female students have different reasons to enroll in higher education. Men have the tendency to rationalize their enrollment decisions to accountability and occupational imbalance in the work-force. Women are more apt to consider the family structure and responsibility. More married students (without regards to gender) had the highest propensity for college enrollment and retention. Students who had recently lost their loved ones, recently got married or divorced, living alone after their offspring(s) had left the home (nest), or added another being to the family size may have different reasons and ambition for higher education. Consistent with the age and gender distributions, marital status is also a significant factor that contribute to enrollment decisions in higher education.

Variable Identification and Definition of Terms

The variables in the proposed study, based on reviews of related literatures, are gender, cognitive field dependence status (FD, FN, and FI -- measured with globally-oriented Group Embedded Figure Test). Other variables in the study are number and hours of high school mathematics and English, scores on computer anxiety and apprehension (from the Computer Anxiety-Apprehension and Attitude Survey), scores on computer attitude, scores on course satisfaction (from the Teaching Effectiveness and Evaluation Survey), and cumulative GPA (high school and college). Composite scores on ACT/SAT, high school and college cumulative GPAs, and number and hours of high school mathematics and English will be obtained from institutional records. They will be measured as continuous variables. Gender, a dichotomous self-reported variable from the questionnaire (Appendix A) will be used as a moderator variable. It will be coded as 1, for male; and 2, for female. The criterion-referenced test will be obtained from the instructors at the end of the semester.

Students' scores on their computer anxiety (and apprehension), computer attitude, and course satisfaction will be computed. Students whose computer anxiety (and apprehension) scores are below (and above) one standard deviation unit from the mean score on computer anxiety (and apprehension) will be considered as low (and high) in their computer anxiety (and apprehension). Those in the middle will be considered as having moderate computer anxiety (and apprehension). Students who scored above the mean on their computer attitude scale will be classified as high attitudinal students; while those whose scores are on or below the mean score on the computer attitude scale will be classified as low in their computer attitude. The aggregate

of the scores on the four sub-scales (Analyst, Objective, Synthesis, and Evaluation) on the Teaching Effectiveness and Evaluation Survey (Ogunyemi & Ikegulu, 1998) will be used as the course satisfaction score. In addition, the course criterion test scores (if available) will also be used as a measure of academic achievement (Delcourt & Kinzie, 1993; Gardner, et al., 1993).

Course Satisfaction

Course satisfaction is a concept used in this study to assess students' perception about the extent of their course satisfaction based on how they perceived their instructors' use of the systems designs principles and, the expectant gain from such utility, and how the use of these principles of instructional systems design paradigm affect their course grades.

Instructional systems design (ISD) is a complex integrated process that involves people, procedures, ideas, devices, and organization, for analyzing problems; and devising, implementing, evaluating, and managing solutions to these problems in a controlled learning and purposive situation (Heinich, Molenda, Russell, & Smaldino, 1996, p. 411).

Conducting Analysis: The students' perceptions about the majority of their instructors' assessment of the student, learning tasks, and the learning context to facilitate the realization and achievement of instructional goals.

Determining Objectives: The students' perceptions about the majority of their instructors' development of instructional strategies using appropriate organizational, management, and delivery techniques to effect learning, induce motivation, and enhance recall.

Focus on Students: The students' perceptions about the majority of their instructors' development of student-centered and learner-empowered instructional strategies and fairness in

grading.

Value Training: The students' perceptions about the majority of their instructors' incorporation of feedbacks from colleagues and "significant others" into the instruction for identification, organization, and implementation of lesson plans in their (instructors and students) instructional materials.

The Group Embedded Figure Test

The visually (or globally) oriented Group Embedded Figure Test (GEFT) (Witkin, Oltman, Raskin, & Karp, 1971) has been defined as a cognitive learning styles and, and will be used in this study to investigate the relationship of the three styles of cognitive learning to academic achievement and course satisfaction relative to gender and computer anxiety-apprehension and computer attitude.

Cognitive styles are conceptualized as stable attitudes, preferences, or habitual strategies determining a person's typical modes of perceiving, remembering, thinking And problem solving (Messick, 1976, p. 26). The visual perception in information processing is based on individual perceptual skills. When learners have similar visuals on the screen, their perceptions for the visuals may be different. These differences among learners are based on their cognitive styles, learner characteristics, or perceptual skills. Field dependent status is "perceptual differential" where the organization of the prevailing field determines the person's perception. Witkin (1979) defined psychological differentiations for the learners by indicating that the field-dependent And field-independent cognitive styles are contrasting modes of processing information. In essence, learners with a field-independent style are likely to use internal referents as primary guides

referents (p.14). In other words, field-dependent and field-independent cognitive styles refer to a general psychological differentiation, in which a person perceives part of a field as discrete from the surrounding field as a whole (Burkhalter & Schaer, 1985).

Cognitive Learning Styles.

The unique ways an individual gathers and processes information and the means by which an individual prefers to learn (Lowery, 1994; Davidson, 1990); "a person's characteristic ways of information processing, feeling, and behaving in and toward learning situations" (Ikeulu, 1997; Smith, 1982; Wlodkowski, 1985, p.179). A particular learning style is the cognitive style of field dependent status. This learning style is usually measured by the Group Embedded Figure Test (GEFT, Witkin, 1979; Witkin et al., 1971, 1977, 1981).

The cognitive styles of field dependence status will be determined as field-dependent (FD), field-neutral (FN), and field-independent (FI) based on the visually-oriented Group Embedded Figure Tests (GEFT, [Witkin, 1979; Witkin, Oltman, & Karp, 1971]). The Field-Independent learner tends to articulate figures as discrete from their backgrounds and can more easily differentiate objects from the embedding context. The Field-Dependent learner, on the other hand, tends to experience events within the content of the whole. The Field-Neutral learner is mid-way the cognitive spectrum.

Academic Achievement

The ability to apply knowledge gained to the successful understanding of topics from a broader range (Bradley Commission on History in Schools, 1988). The criterion course test scores and/or the college cumulative GPA will be used as the attributes for sensing this variable.

Computer

A device, electronic in nature, whose operation is controlled by instructions stored in its own memory unit. A computer arithmetically and logically processes data (input) and produces output from the processing (Shelly, Cashman, & Waggoner, 1992).

Computer utilization affords the luxury of combining traditional classroom activities with that of technology-driven classroom environment. This chapter has provided a brief description of the history of computer technology, and how it (computer or educational technology) has assumed a place in education. Additionally, this chapter has provided the statement of the problem, the purpose of the study, the significance of the study, research questions, and hypotheses

Computer Attitude: A behavioral by-product of an individual's experiences with certain situations and within certain cultural groups (Cothern & Collins, 1992, p.85); a combination of a perception with a judgment that often results in an emotion that influences behavior (Ellis, 1962; Wlodkowski, 1985, p. 72).

Computer Anxiety-Apprehension: People who experience computer anxiety (and apprehension) exhibit behaviors like avoiding contact with the machine, minimizing the amount of time they spend with computers, being excessively cautious while operating the machine, and making negative and sometimes derrogative comments about computers (in general) and the process involved in computers (Delcourt & Kinzie, 1993; Gardner et al., 1993).

Background of the Proposed Study

Decades ago, we lived in a society where computers were rare and played a minor role in our everyday lives. The advancements in computer and educational technology have prompted people to become more dependent upon computers for their daily tasks. Because of the versatility and availability of computers, people believe that knowing how to use a computer is almost a basic skill. This basic skill has faded away from the highly scientific arena into the education arena. This move has prompted researchers to explore and investigate the implications of and the relationships between teaching strategies, students' cognitive learning styles with respect to academic achievement and course satisfaction (Ikegulu, 1997; Ogunyemi & Ikegulu, 1998) as they relate to gender and individuals classified as low, moderate, or high in their computer anxiety-apprehension and/or computer attitude (Davis, 1999; Gardner, Discenza, & Dukes, 1993).

Perceived self-efficacy about computers reflects an individual's confidence in his or her ability to perform the behaviors required to produce specific outcomes. Many adult learners who are being introduced to the computer technology for the first time have deep-rooted misconceptions of what computers can and cannot do. Some have the "magic machine" misconception, where they suppose that if you learn a few magical commands a computer can do just about anything. These students have difficulties learning programming languages and operating systems command syntax, since they try to memorize the individual keystrokes of a command instead of comprehending reasons for the syntax. Still, other students have the "doomsday machine" (derived from science fiction movies) misconception, where they are

afraid they will push the wrong button and destroy the machine and their grades in the course. These students need constant encouragement and reassurance that virtually any error they make with the computer can be corrected. To these students, microcomputers are magical machines that perform wonders; and attempts to educate and re-teach "old dogs new tricks" is not without difficulty. The old adage "putting new wine in an old wine bottle" stands as a test of the daily instructional motivation institutional faculty must integrate in their curricula to embrace these "new" students in higher education to re-educate them for their proper roles in the industry and society.

Microcomputers in the classroom represent a dramatic change to administrators, faculty, And students. This change is perceived in the industry (workplace environment) as a lack of preparation and weak curricula in pre-postsecondary and postsecondary institutions. While microcomputers are becoming more available in the schools, a number of serious issues about implementing a change in the classrooms must be faced by administrators and faculty. Bentzen (1974), Goodlad (1980), Lortie (1975), and Huberman and Miles (1984) noted that change should be viewed as a complex process consisting of many important variables (e.g., time, clarity, credibility, curricula and institutional structure, and the resistance of faculty to change). Hall (1978) more specifically pointed out that a major reason for failure to implement innovations has been the inattention accorded the individual user involved in the change process. While school systems press to implement changes and goals in the classrooms, faculty and students vary in the quality of their expertise, interest and acceptance of the new technology, and seem to express a basic fear of a computer and its related technologies.

Affectively, computer and technology literacy is a contact with the activities of computing deep enough to make the computational equivalent of reading and writing fluently and enjoyably (Kay, 1984). This definition incorporates the aspects of computer phobia that both faculty And mature or nontraditional students always have problems with. Unless the real concerns of faculty anxiety and apprehension about computers are seriously and systematically considered as a critical variable in the change process, both students' and instructors' attitudes about computers will continue to take on the usual "hit and miss" orientation so typical of most of the innovations that educators and employers effectuate. For innovations to be successfully implemented, attention must be given to the personal concerns and involvement of individuals in the change process because change occurs only when individuals change (Hall, 1978).

It will be daunting to say that microcomputers have not revolutionized the world of work in the industry, agriculture, health, home economics, and business. The microprocessor has not only changed the world of work to include robotics, optical scanners, And word processors, it has changed our everyday lives with devices like programmable applications, personal computers, And automatic teller machines (ATM). Computers have become an everyday fact of life. The advent of inexpensive microcomputers has revolutionized information technology in much the same way as the Gutenburg's printing press. The wide spread availability of printed word created a need for people to be literate. Innovations in computer technology have necessitated a new kind of literacy.

In the broadest sense, computer technology extends our abilities to change the world -- to cut, shape, or put together materials; to move things from one place to another; to reach farther

with our hands, minds, senses, and voices (Delcourt & Kinzie, 1993). For students and instructors, computer technologies have these potentials. Word processing, electronic mails, and data bases on compact discs (CD-ROMs), and other technologies can assist instructors in instructional management and improvement, communication with both peers and experts, and identification of new instructional methods and materials. Besides the benefits in personal effectiveness, instructors who use these technologies are likely to be important models for their students, help in reducing computer anxiety (and apprehension) in students, and helping to produce students with positive attitudes towards computer technologies. This latter effect may be of critical importance since many students are emerging from schools with an aversion to science, mathematics, and technology.

Cognitive Learning Styles: A Pragmatic Framework

Cognitive styles of field dependence status (CSFDS, field-dependent field-neutral, and field-independent) are conceptualized as stable attitudes, preferences, or habitual strategies which determine an individual's typical modes of perceiving, remembering, thinking, and problem solving (Messick, 1976, p. 20). Field independent [illegible] di[illegible] the whole. Field-neutral individuals are mid-way between these two learning modes (Burkhalter & Schaer, 1985; Elliot, 1976; Eysneck, 1993; Livingston, 1991; Young, 1996).

Cognitive styles of field dependence status is a concept that deals with thought patterns and their relationship to the environmental factors. Field dependence status is the "perceptual

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differential" where the organization of the prevailing field determines the person's perception (Ikegulu, 1997).

The concept 'learning styles' assumes that learners (in stages of learning) are in constant flux with their environments (Kolb, 1976, 1984). According to Messick (1976), learning styles is a generic term that includes three distinct sub-styles: cognitive, affective, and physiological. Inherent within this trichotomy are several aspects of learning as they relate to the learner's socio-cultural, ethnolinguistic, and physiological environments (Davis, 1999; Ikegulu, 1997). Kolb's (1984) model divides the learning process in four stages of learning styles: 'Accommodator' - learning from example, doing, or acting; 'Assimilator' - learning by logical thinking; 'Converger' - learning by watching and listening (i.e., theory-based learning); and 'Diverger' - learning by analyzing.

Operationally, 'cognitive learning styles' are the preferred ways learners adapt to learning new information and skills; a pattern of information absorbing, processing, and regurgitating of anchored information stored in the student's reservoir of learned materials (Ikegulu, 1997). Learning styles is an array of socio-cultural, linguistic, experiential, and educational factors that influence the way diverse students learn (Burkhalter & Schaer, 1985; Garcia, 1991; Henderson & Landesman, 1995; Messick, 1976).

Computer Anxiety and Cognitive Learning Styles

Anxiety about computers has been investigated in high school students (Bear, Richards, & Lancaster, 1987; Campbell & Dobson, 1987; Collis, 1987; Delcourt, 1985; Loyd & Gressard, 1984), in college and nursing students (Chang, 1984; Coover & Delcourt, 1992; Dambrot,

Watkins-Malek, Silling, Marshall, & Garver, 1985) with few researchers assessing computer self-efficacy expectations (Miura, 1987; Murphy, Coover, & Owens, 1988; Delcourt & Kinzie, 1993). None of the studies (to date) examined the impacts of gender, commuter anxiety, computer apprehension, and students' academic achievement and performance together.

One goal of research on computer anxiety, computer apprehension, and computer attitude has been to identify the greatest psychological obstacles that have the potential to prohibit students from learning how to use computers in classrooms and at work. On construct in particular, computer anxiety-apprehension, is considered to be a major cause of resistance to using computers for leisure, course work, and productivity. Most definitions of computer anxiety focus on negative emotional reactions to the use, or anticipated use of computers, which are perceived as personally threatening to the user. These negative reactions include fear or phobia, hostility, apprehension, and a desire to withdraw from the anxiety-apprehension-provoking situation. This "withdrawal syndrome" has been attributed to lack of knowledge and expertise and, induced low expectations and persistence during the task; which tantamount to low attitude towards computers and computer technologies. In particular, the literature suggests that individuals with high apprehension about computers and their related technologies also have high anxiety about computers, which reduces their attitude, self-efficacy, and potential gains and utility of computer technology (Gardner, Dicenza, & Duke, 1993; Kay, 1984; Welty, 1987).

Cognitive styles of field dependence -- field-independent (FI), field-neutral (FN), and field-dependent (FD) -- which represent the learners' typical mode of gaining, storing, processing, and using information, accounts for considerable variations in academic

achievement among learners with diverse socioeconomic backgrounds, demography, and ability levels (Chinien & Boutin, 1993). Cognitive styles are the information processing habits representing learners' typical modes of perceiving, thinking, remembering, problem-solving, and rehearsing. These styles constitute important dimensions of individual differences among students and appear to have important implications for instructional designers and students with anxiety-apprehension and attitudinal behaviors about computer technology.

Wallace and Gregory (1985) indicated that there have been over 3,000 research studies conducted on cognitive styles through which a large number of cognitive learning styles dimensions have been identified. Kirby (1979) provided a comprehensive summary of 19 different cognitive learning styles constructs: field-dependent/independent; analytical/non-analytical conceptualizers; impulsivity/reflectiveness; risk-taking/caution; perceptive receptive/systematic intuitive; leveling/sharpening; scanning/focusing; cognitive complexity/simplicity; constricted/flexible control; broad/narrow category width (equivalence range); tolerance for incongruous or unrealistic experiences; conceptual articulation (conceptual discrimination); and conceptual integration/ integrative complexity (Kirby, 1979, pp. 52-53). One of the cognitive styles which is of most significance in education problems and has been more extensively researched is the construct field-dependent/field-independent. However, this proposed dissertation study will utilize a global construct field-dependent, field-neutral, and filed-independent (Davis, 1999; Griffin & Franklin, 1996).

Students' overall mean score on the group-embedded figure test (GEFT) will be computed and those falling one standard deviation unit above (and below) the overall mean

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GEFT score for the entire sample will be designated as field-independent and field-dependent respectively; whereas, those within the sample GEFT mean will be classified as field-neutral. The rationale for this categorization stemmed from the fact that educators and practioners need to understand how these three groups of cognitive learning styles are affected by the learners' perceived levels of computer anxiety/apprehension (low, moderate, and high).

Theoretical and Pragmatic Frameworks

The literature on the relationships between computer anxiety-apprehension, computer attitude, and students' scholastic achievement and their course satisfaction can hardly be considered encouraging. Evidence abounds on general and state anxiety and on computer anxiety-apprehension and their correlates. After several decades of research, most widely recognized measures of computer anxiety, apprehension, attitude, and self-efficacy have been found to correlate with academic achievement only in an inconsistent manner, and even then, the correlation never exceeded 0.25 (Davis, 1999; Knowles, 1973; Ross, et al., 1993). While there are many reasons for the lack of substantial and consistent relationships in the education literature, one potential explanation is the almost exclusive reliance on the assessment of computer anxiety-apprehension which operationalized anxiety traits as generalized dispositions rather than situational dispositions. Operationally, this means that measures of computer anxiety-apprehension has been developed to apply across many situations rather than in single situations and/or content. This focused on three broad dimensions in educational settings. Specifically, these dimensions are computer anxiety, computer apprehension, and computer attitudes. These dimensions are usually discussed within the pedagogical underpinnings of instructional and/or

classroom anxiety as they relate to communication and writing apprehension and anxiety; and general and state anxiety as they relate to computer anxiety-apprehension, academic achievement, and academic performance.

Pedagogical Roots of Anxiety and Apprehension

The present investigation focused on one narrower dimension of computer utility in an instructional environment: computer anxiety-apprehension. This dimensions is discussed within the theoretical frameworks of instructional and/or classroom anxiety as they relate to communication and writing apprehension and anxiety; and general and state anxiety as they relate to computer anxiety-apprehension, academic achievement, and course satisfaction.

Communication and Writing Anxiety and Apprehension.

Computer science and mathematics are not the only disciplines to recognize anxiety and its detrimental effects on students' performance. Anxiety and apprehension have plagued students' written composition and essays for the past six decades. Within the past four decades, a number of investigators in the field of speech communication have examined the role of anxiety and apprehension as they relate to interpersonal communication and human interaction. The conclusion from these investigations is that communication apprehension is a pervasive trait that seriously affects a large number of individuals (Clavenger, 1974; Heston & Paterline, 1974; Phillips & Metzger, 1973).

Phillips (1968) offered the best definition of this phobia. The highly apprehensive individuals are those for whom anxiety about communication out-weighs their projection of gains from such situations. That is, the highly apprehensive individuals have the tendency to avoid

communication situations or react in some anxious manner if compelled because they foresee primarily negative consequences from such engagements. Specific research findings have indicated that highly apprehensive individuals have the potential to be less motivated to achieve (Giffin & Gilham, 1971) and generally engage in less self-disclosure (Hamilton, 1972). Furthermore, they also tend to select occupations that they perceive to have minimum communication (Daly & Shamos, 1976, 1978), as well as, chose housing and seating positions that require less communication. High communication apprehensives seldom engage in group dynamics; and when forced to, contribute very little to the group (Daly, 1981; Daly & Shamos, 1976, 1978). As one would expect, research has also demonstrated that individuals who have such apprehension tend to exhibit low self-concept (Johnson, 1973), which in turn is often reflected and reinforced by those they interact with; and receive lower ratings in groups and on both credibility and interpersonal relations (Karst & Most, 1973).

Writing is one of the means of communication and has been of national concern, particularly since the writing skills of students have diminished. The decline in college students' writing quality can be attributed to the presence of communication apprehension and the absence of verbal precision in television, advertising, and political language. It is also due to the lack of writing practice in high school English courses, underprepared English Teachers, and the difficulties involved in evaluating students' writing. In addition, writing instructors who revealed a decrease in the writing skills of entering freshmen indicated that students had decreased in communication of logical ideas, development and construction of mature and grammatical sentences, spelling, organization and coherence of the total composition, and punctuation

(Cullum, 1991; Daly, 1978c; Daly & Shamos, 1978; Hayes, 1981).

For the past 30 years, the psychosocial construct writing apprehension has been of particular interest to researchers, writing instructors, and educators at-large. Consequently, an abundance of empirical studies have examined writing apprehension to determine its impact on the writing skills of students. Studies have revealed that writing anxiety is a consequence of high writing apprehension. John Daly, one of the major proponents leading the field of research on writing apprehension, is responsible for coining the term writing apprehension: "A situation and subject specific individual difference associated with a person's tendencies to approach or avoid situations perceived to potentially require writing accompanied by some amount of perceived evaluation" (Daly, 1981, p. 10).

With regards to writing, students are labeled as either high or low apprehensives. High apprehensives tend to find writing unrewarding and punishing while low apprehensives find it rewarding and enjoyable. More specifically, high apprehensives tend to avoid situations requiring writing, which to a large extent reduces their opportunities for practice which is crucial to the development of writing skills. In general, high apprehensives perform lower on standardized tests of writing skills and abilities than do low apprehensives; and are less likely to succeed in a variety of academic subject areas than their low apprehensive counterparts. While low apprehensives write more and use more qualifications, high apprehensives tend to write less, use fewer qualifications, usually choose a lower level of vocabulary, and lack creativity .

Literature abounds on the relationships of writing apprehension to self-esteem (Daly,

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1977, 1978c); message intensity, sex differences, and SAT scores (Daly & Miller, 1975c; Daly & Shamos, 1976); success expectations, and willingness to take advanced courses (Daly & Miller, 1975b, 1975c; Daly & Shamos, 1976); and academic and occupational choices, decisions, and preferences (Daly & Shamos, 1976, 1978). However, much of the research has focused on writing apprehension and students' writing performance in terms of writing aptitude, writing ability, and language intensity (Clifford, 1981; Faigley, Daly & Witte, 1981; Hayes, 1981). Few of these studies were devoted to writing apprehension and anxiety.

Anxiety about writing is perhaps the most common form of writing deficit that both experienced and inexperienced students will encounter when composing. The causes of writing anxiety vary from neurological problems that underlie language processing, poor skill development, and inadequate role models to lack of an understanding of the composing process and an authoritative, teacher-centered, product-based mode of teaching. Overall, researchers argue that writing anxiety stems from a student's previous academic success. Although the symptoms are all too familiar, a number of studies have examined the causes and predictable effects of writing anxiety in order to help improve the writing skills of college students (Clifford, 1978, 1981; Connors & Lunsford, 1993; Schultz & Meyers, 1981; Shrewsbury, 1995).

General and State Anxiety.

Contemporary anxiety theory and research have maintained that anxiety is a multifaceted emotion that has the potential to disrupt cognitive and metamemorial activities at several stages of information formation and processing.

Anxiety may affect test performance (and ability) by interfering with test preparation and

study habits. Students who are generally anxious about taking a test may fail to use appropriate test-taking strategies and study skills to: (1) direct their attention to relevant information, (2) integrate information in memory, (3) assess their learning state through some form of self-evaluation, and (4) believe in their mental models (Guller & Holahen, 1980; McKeachie, Pintrich, & Lin, 1985). Another theoretical account of the relationship between anxiety-apprehension and performance proposes that anxiety-apprehension interferes with cognitive activities at the time of the evaluation. Anxious students may become preoccupied with, be apprehensive, and/or worry about their performance and these intrusive thoughts may undermine the students' self-esteem, interfering with their ability to sustain attention to task-relevant instructional materials; thereby, preventing the students from engaging in cognitive operations (e.g., use of a variety of logical rules and recall)that would facilitate test performance (Deffenbacher, 1982; Sarason, 1985).

One common complaint offered by developmental students who do poorly in college is that they experience high levels of state and/or test anxiety which impairs their ability to perform well when evaluated (Ikegulu, 1998; Barham & Ikegulu, 2000).The theoretical framework for the Barham and Ikegulu's (2000) study revolved around two interrelated theories: Study-Skills Deficit and Cognitive-Attentional Interference. Both theories are often discussed under the pragmatic frameworks of the Deficiency and General Test Anxiety and, the Interference and State Anxiety models (Cavallaro & Meyers, 1986; Dendato & Diener, 1986; Holahan, 1980; McKeachie, Pintrich, & Lin, 1985).

Two hypotheses were proposed: (1) Females would not be significantly different than

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males in their academic performance, mean persistence time, and persistence distribution. (2) First-generation and non-first-generation developmental students would be significantly different in their academic performance, mean persistence times, and persistence distributions. The "Mathematics Anxiety-Apprehension Survey" was administered to students in twelve classes differing in composition and content. The product limit Kaplan-Meier (1951) estimator was employed to estimate the persistence distributions for the sample. Low mathematics anxiety was consistently related to high academic performance and the likelihood to persist in college. In all comparisons, gender was significant but first-generation status was not.

Methodology and Analytical Procedures

Research Design

A 2 X 3 X 3 factorial design was used to analyze the collected data (See Table 1). This design is suitable for this type of study because it allowed me to focus on the differential main and possible interaction effects of the fixed factors gender (male and female), computer anxiety-apprehension (low, moderate, and high), and cognitive learning styles (FI, FN, and FD) on the outcome academic achievement and performance (as measures students college cumulative GPA and aggregate scores on their criterion tests).

Within the pedagogical equity espoused by the contemporary anxiety theorists and researchers, communication and stage apprehension perpetuate general and test anxiety; and that anxiety of any form has the tendency to affect an individual's attitude towards the task, the completion time of the task, and the general performance of the task over a sustained period of

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time (Bandura, 1997; Bandura, Adams, & Beyer, 1997; Chang, 1984; Collis, 1987; Deffenbacher, 1982; Gardner, et al., 1993; Hunter & Aiken, 1987; Kay, 1984; Murphy, et al., 1986; Owens, 1986; Sarason, 1985; Schunk, 1985). Thus, the anticipated or expectant anxiety perceived as a multifaceted emotion that has the potential to disrupt cognitive and metamemorial activities at several stages, has been reasoned to inhibit attitudinal behaviors in individuals characterized as high in their computer anxiety-apprehension. Since the globally-oriented group embedded figure test (GEFT) is highly correlated with students' academic achievement, high school GPA, and ACT/SAT score (Griffin & Franklin, 1996), this study wishes to investigate if this construct will also correlate with computer anxiety-apprehension and computer attitude, as well as, students' academic achievement (college cumulative GPA) and their course satisfaction (overall score on the Teacher Effectiveness and Evaluation Survey). Therefore, it is pragmatically possible that computer anxiety-apprehension could be perceived as a behavioral trait that is nested within computer attitude (Neter, Wassaman,& Kutner, 1989). This approach will be examined in this study using a factorial design. The models considered are given by (Burkhalter & Schaer, 1985; Neter, et al., 1989). Table 1 was designed for a larger study that incorporated all the variables. That is, this table is for the two preliminary studies (I & II). Only the information pertaining to each study were used (extracted) from the table.

Table 1

A Three-by-Three-by-Two-by-Two Factorial (Nested) Design Layout: Interrelationships among Cognitive Learning Styles (3), Gender (2), Computer Anxiety-Apprehension (3), and Computer Attitude (2)

Cognitive Learning Styles (GEFT)	Gender	Computer Attitude						
		Low Attitudinal			High Attitudinal			Row Total
		Computer Anxiety-Appreh			Computer Anxiety-Appreh			
		Low	Moderate	High	Low	Moderate	High	
Field Dependent	Male	$n_{111(1)}$	$n_{111(2)}$	$n_{111(3)}$	$n_{112(1)}$	$n_{112(2)}$	$n_{112(3)}$	$n_{11.(.)}$
	Female	$n_{121(1)}$	$n_{121(2)}$	$n_{121(3)}$	$n_{122(1)}$	$n_{122(2)}$	$n_{122(3)}$	$n_{12.(.)}$
Field Neutral	Male	$n_{211(1)}$	$n_{211(2)}$	$n_{211(3)}$	$n_{212(1)}$	$n_{212(2)}$	$n_{212(3)}$	$n_{21.(.)}$
	Female	$n_{221(1)}$	$n_{221(2)}$	$n_{221(3)}$	$n_{222(1)}$	$n_{222(2)}$	$n_{222(3)}$	$n_{22.(.)}$
Field Independent	Male	$n_{311(1)}$	$n_{311(2)}$	$n_{311(3)}$	$n_{312(1)}$	$n_{312(2)}$	$n_{312(3)}$	$n_{31.(.)}$
	Female	$n_{321(1)}$	$n_{321(2)}$	$n_{321(3)}$	$n_{322(1)}$	$n_{322(2)}$	$n_{322(3)}$	$n_{32.(.)}$
Column Total		$n_{..k(1)}$	$n_{..k(2)}$	$n_{..k(3)}$	$n_{..l(1)}$	$n_{..l(2)}$	$n_{..l(3)}$	N

Note.

(1) n_{ijkl} = is the cell frequency of the student (participant) with the ith cognitive style and of the jth gender whose kth level of computer anxiety is nested within his/her lth attitudinal level about computers; for all I = 1, 2, & 3; j = 1 & 2; k = 1, 2, & 3; and l = 1 & 2).

(2) $\sum\sum n_{..kl(.)} = N$ (the sample size; k = 1,2, & 3 and l = 1 & 2); and

(3) $\sum\sum n_{ij..(.)} = N$ (the sample size; I = 1, 2, & 3 and j = 1 & 2).

$$Y_{ijklr} = \mu_{...} + \alpha_i + \beta_j + \varphi(\gamma)_{kl} + (\alpha\beta)_{ij} + \alpha_i(\varphi(\gamma)_{kl}) + \beta_j(\varphi(\gamma)_{kl}) + (\alpha\beta_{ij}(\varphi(\gamma)_{kl}) + \epsilon_{ijklm}$$

where,

Y_{ijklr} = The college cumulative GPA of the rth student (r = 1, , 3, ..., N).

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Y^*_{ijkl} = The Criterion Test score of the lth student (l = 1, , 3, ..., N).

$\mu_{\ldots\ldots}$ = The grand mend of the dependent outcome under consideration.

α_i = The cognitive style of field dependence status main effect (I = 1, 2, & 3).

β_j = The gender main effect (j = 1 & 2).

φ_k =Effect of the kth computer anxiety-apprehension (k = 1, 2, & 3).

$\alpha\varphi_{ik}$ = The gender-by-computer anxiety interaction term.

$\beta\varphi_{jk}$ = The cognitive styles-by-computer anxiety interaction term.

$\alpha\beta\varphi_{ijk}$ = The gender-by-cognitive styles-by-computer anxiety interaction term.

ϵ_{ijkl} = The error term.

Population, Sample, and Instrument

Consent forms were obtained from two instructors (one male and one female) who were teaching these courses and agreed to have their classes evaluated. A total of 140 students enrolled in six Basic/Developmental Mathematics course were asked to complete a questionnaire concerning their instructors' classroom attitudes and teaching effectiveness. The male instructor has a terminal degree in education with about 13 years of post secondary teaching experience. The female instructor has an earned masters degree in mathematics education with a cumulative teaching experience in the public and postsecondary environments totaling 26 years. The students (participants) in this study were attending a four-year public and religiously affiliated institution in the Southeastern part of Texas with a population of approximately 500 students.

Materials for the students included the consent form with the demographic information,

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'Computer Anxiety-Apprehension and Attitude Survey (CAAAS),' the Ogunyemi and Ikegulu's (1998) 'Teacher Effectiveness and Evaluation Survey (TEES),' and the Witkin's (1979) and Witkin, et al.'s (1971, 1977) visually-oriented 'Group Embedded Figure Test (GEFT).' The Demographic Profile/Consent Form solicited students' demographic/background (gender, ethnicity, age or date of birth, classification, number and hours of high school mathematics and English, etc.) information. The CAAAS, TEES, and GEFT were used to collect data on students' perceived computer anxiety and attitude, instructors' teaching effectiveness, and visual/global embedded figures. These three instruments (See Appendix) were estimated to take the students approximately 30 minutes to complete.

The first page of the questionnaire (The Computer Anxiety-Apprehension and Attitude Survey) lists 55 items on a five-point Likert scale (strongly agree to strongly disagree) that request information about the students' perceived computer anxiety-apprehension and computer attitude. Items 1 and 26 are related to computer anxiety-apprehension. Items 27 to 55 deal with computer attitude. These items are a combination of Maurer's (1983) "Computer Anxiety Index (CAIN)," which assesses students' computer anxiety (and apprehension); and Lloyd and Gressard's (1984b) "Computer Attitude Scale (CAS)," which measures students' attitudes toward computers. Cluster analyses were performed on all items and the items that clustered together were selected for inclusion into the CAAAS. The overall coefficient alpha for this instrument is 0.9486; indicating that about 89.98 percent of the total variance in global computer anxiety-apprehension-attitude dimensions was explained by the students' perceptions bout their computer phobias. The 26 items related to computer anxiety-apprehension has an overall alpha

reliability of 0.7464; whereas, the 29 items that assessed computer attitude has an alpha of 0.6695.

The Teacher Effectiveness and Evaluation Survey (Ogunyemi & Ikegulu, 1998) is an integrated instrument that incorporates Branch's (1994) "Teacher Planning Inventory Survey (TPIS)." This instrument measured the common instructional design practices instructors employed in their classrooms as well as the students' perception of their instructors' teaching effectiveness in classrooms. The TEES instrument consisted of 41 items on a Likert scale -- 1, almost always true; 2, often true; 3, generally true; 4, occasionally true; and 5, almost never true -- was grouped into four factorially derived constructs as depicted in Table 1: Task Analysis, Instructional Objectives, Instructional Synthesis, and Instructional Evaluation. The 41 items on the TEES instrument was constructed in 1996 following the curriculum and evaluation of the Department of Mathematics and Computer Science Accreditation Committee's request (Ogunyemi & Ikegulu, 1998). While no information on content validity of the instrument was available at the time of this study, the items were selected and approved by a panel of staff psychologists and educators at the institution. In addition, the instrument has the same format with Branch's (1994) Teacher Planning Inventory with modifications.

Both instructors were debriefed about the process and were also asked to sign consent statements. Participating students voluntarily completed the consent form and then completed the questionnaire. At set times (in the absence of the instructors) agreed upon by the instructors, research assistants entered the classrooms and distributed the CAAAS, TEES, and GEFT (in that order) to the students. Both the consent forms and the instruments were returned together. The

consent form itself was anonymous in that it did not ask for the participants' names or any other type of identification. However, each of the 140 students was awarded five bonus points for participation.

Students' cumulative GPAs and the overall test scores on the teacher-made criterion referenced tests, assignments, and were quizzes were obtained at the end of the semester. The composite scores on the TEES (course satisfaction) and criterion test scores (academic performance), as well as, the students' cumulative GPA (academic achievement) were used as outcome variables. Students' age was used as a covariate; and gender, levels of computer anxiety (Low, Moderate, and High), computer attitude (low and High), and GEFT (FD, FN, and FI) were used as the fixed-factor effects.

Research Questions and Hypotheses

This preliminary study focused on the following research issues: (1) the differential effects of computer attitude (low and high) and students' academic achievement and/or performance (as measured by their college cumulative GPA and/or aggregate scores on their criterion course exams) and course satisfaction with respect to gender; (2) the differential effects of gender on the academic achievement and/or performance and course satisfaction of students classified as low, moderate, and high in their computer anxiety-apprehension; and (3) the differential effects on academic achievement and performance of students classified as field-dependent, field-neutral, and field-independent in their cognitive learning styles. The following research questions were addressed:

1. Is there a significant main effect between computer anxiety and students' academic

achievement and performance with respect to cognitive learning styles?

2. Is there a significant main effect between computer anxiety and students' academic achievement and performance with respect to gender?

3. Are there significant main effects between computer anxiety and students' academic achievement and performance with respect to gender and cognitive learning styles?

To determine the influence and relationship of utilizing computers (computer based instruction) in traditional classroom settings on student's academic achievement and on student's attitude toward computers, the following null hypotheses will be examined:

H_{01}: There is no statistically significant difference in the academic achievements and performance of students' classified as field-dependent, field neutral, and field-independent learners.

H_{02}:. There is no significant main effect between male and female students' academic achievement and performance.

H_{03}: There are no significant main effects in students' academic achievement and performance with respect to their levels of computer anxiety.

H_{04}: There are no significant interaction effects among gender, computer anxiety, and cognitive learning styles with respect to students' academic achievement and performance.

Results and Discussion

Summary measures were used to describe the sample characteristics. The sample consisted of 130 (93%) Non-Hispanics; 24 (17.1%) White/Caucasian Americans, 106 (75.7%)

African Americans; nine (9, 6.4%) Hispanic Americans; and only one (1, 0.7%) foreign student. The gender distribution were 60 (42.9%) males and 80 (57.1%) females. About 105 (75%) of the sample considered themselves first-generation college students; reported that at least one of their parents (77, 55.0%) or their siblings (82, 58.6%) did not graduate from college. The majority of these students had at least three people residing in their households (130, 92.9%); came from either a single-parent system (59, 42.1%); and a two-family system with either natural or adopted parents (64, 45.7%) or step-parents (17, 12.1%) family background. Table 2 is a summary measure of the academic indicators.

From Table 2, number and hours of high school mathematics and English taken were consistent with the studies conducted by Barham (1992), Barham and Ogunyemi (1992, 1994), and Ikegulu (1996). The mean high school and college cumulative GPAs were also consistent with Ikegulu's (1996) study on the predictive indicators of academic performance in College Algebra for Post-Developmental students: high school GPA (Mean = 2.57, SD = 0.50), and College GPA (Mean = 2.48, SD = 0.62). The mean age for the respondents in this study was 19.43 years (SD = 1.11). the range was four years (21 minus 17), and the median age was 19 years. Thus, the sample under investigation could be regarded as traditional college students. Boylan, Bonham, & Bliss (1992), in their National Study of the Performance of Minority Students in Developmental Education, reported the mean age for their subjects as 21.0 years and the range as 49 years (65 minus 16).

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Table 2

Summary Measures for the Academically Related Variables

Indicator Variables	Minimum	Maximum	Mean	SD
Students' Age	17	21	19.43	1.11
Number of high school Math	2	4	2.99	0.73
Number of high school English	2	12	3.35	0.76
Hours of high school Math	6	12	8.98	2.17
Hours of high school English	6	12	10.05	2.27
High school GPA	1.00	4.00	3.03	0.56
College cumulative GPA	1.00	3.90	2.83	0.60

It has been conjectured that pre-college variables have significant impacts on students' academic achievement and persistence beyond the freshman year. The degree of impact of these academic indicators has not been fully studied. Advocates for the 'equal educational opportunity for all' claim that developmental education is a 'game of nix,' is not beneficial to the students and faculty alike, and will never enhance students' academic performance in higher education. As a preliminary investigation, Tables 3 and 4 offers comparisons of the gender, computer anxiety and attitude, and cognitive learning styles, as well as students' course satisfaction summary measures of the academically related indicator variables. The means (and standard deviation) from Table 3 did show significant differences in these academically related variables by age.

Table 3

Comparative Summary Frequencies of the Students' Computer Anxiety and Cognitive Learning Styles by Computer Attitude and Gender

Classification Variables	Computer Anxiety			
	Low	Moderate	High	Total
		Low Computer Attitude		
Cognitive Learning Styles	12	50	11	73
Field-Dependent	3	18	3	24
Field-Neutral	9	14	3	26
Field-Independent	0	18	5	23
		High Computer Attitude		
Cognitive Learning Styles	10	48	9	67
Field-Dependent	4	14	0	18
Field-Neutral	4	21	5	30
Field-Independent	2	13	4	19
		Male Students		
Cognitive Learning Styles	8	43	9	60
Field-Dependent	3	17	2	22
Field-Neutral	4	14	3	21
Field-Independent	1	12	4	17
		Female Students		
Cognitive Learning Styles	14	55	11	80
Field-Dependent	4	15	1	20
Field-Neutral	9	21	5	35
Field-Independent	1	19	5	25

Female students have higher mean high school and college GPAs, are more likely to perform better, are less likely to exhibit lower computer anxiety, and be less satisfied with the than male students. Field-independent students have high mean academic performance (test scores); and are more likely to be satisfied than field-neutral and field-dependent students. The majority of the sample are clustered within the field-neutral and moderate computer anxiety categories. None of the students at the low computer attitude group is field-dependent; and none of the students at the high computer attitude group is field-independent. Therefore, there is no possibility of the computer anxiety by computer attitude, gender by computer anxiety by computer attitude, cognitive learning styles by computer anxiety by computer attitude, cognitive learning styles by computer anxiety (and by computer attitude), and gender by cognitive learning styles interaction effects. In addition, levels of computer anxiety are not likely to be nested within levels of computer attitude.

A higher mean scores on the computer anxiety-apprehension scale indicated that the students were in agreement that the `truth' about the item in question reflected their level of computer anxiety (apprehension). From Table 4, female students exhibited the higher propensity for higher academic achievement and performance than male students; however, male students have overall (and its components) higher mean course satisfaction than their female counterparts. The most significant difference is observed for the instructional evaluation (EVALUATE) between the males and females. Consistent with the results of Table 3, Table 4 also indicated that the field-independent students, although pragmatically older, exhibited the

Table 4

Gender, Computer Anxiety and Attitude, Cognitive Learning Styles, and Course Satisfaction Comparisons among the Academically Related Variables

Indicator Variables	Means and (Standard Deviation)	
	Gender	
	Male (N = 60)	Female (N = 80)
Students' Age	17.47 (1.05)	17.40 (1.15)
High school GPA	2.96 (0.60)	3.10 (0.59)
Academic Achievement (GPA)	2.77 (0.61)	2.87 (0.60)
Academic Performance (Test Score)	73.07 (17.28)	77.14 (14.84)
Course Satisfaction Score (TEES Score)	106.58 (37.96)	114.25 (38.17)
Task Analysis	104.00 (43.48)	110.60 (47.96)
Instructional Objective	104.98 (38.35)	112.94 (39.42)
Instructional Synthesis	109.65 (37.56)	116.54 (35.99)
Instructional Evaluation	105.02 (41.20)	113.81 (41.77)

	Cognitive Learning Styles		
	Dependent (N = 42)	Neutral (N = 56)	Independent (N = 42)
Students' Age	17.48 (1.02)	17.28 (1.16)	17.57 (1.13)
High school GPA	2.36 (0.65)	2.50 (0.59)	2.83 (0.56)
Academic Achievement (GPA)	2.37 (0.51)	2.69 (0.30)	2.82 (0.45)
Academic Performance (Test Score)	55.74 (10.17)	78.88 (6.38)	90.40 (6.18)
Course Satisfaction Score	104.55 (35.35)	114.09 (41.90)	113.21 (35.55)
Task Analysis	99.18 (41.21)	109.53 (47.88)	114.02 (47.91)
Instructional Objective	104.45 (34.68)	113.02 (44.62)	109.94 (35.29)
Instructional Synthesis	108.23 (35.33)	115.73 (39.24)	116.10 (34.79)
Instructional Evaluation	102.43 (38.83)	114.61 (45.64)	111.59 (38.43)

Table 4 (Continues)

Table 4 (Continued)

Gender, Computer Anxiety and Attitude, Cognitive Learning Styles, and Course Satisfaction Comparisons among the Academically Related Variables

Indicator Variables	Means and (Standard Deviation)		
	Computer Anxiety		
	Low (N = 22)	Moderate (N = 98)	High (N = 20)
Students' Age	17.77 (0.92)	17.26 (1.10)	17.43 (1.17)
High school GPA	2.76 (0.60)	2.80 (0.59)	2.82 (0.58)
Academic Achievement (GPA)	2.79 (0.46)	2.80 (0.62)	3.00 (0.67)
Academic Performance (Test Score)	72.27 (12.94)	75.00 (16.76)	80.75 (14.53)
Course Satisfaction Score	102.68 (39.90)	112.28 (37.63)	113.65 (39.44)
Task Analysis	99.15 (47.67)	109.45 (47.57)	109.06 (36.68)
Instructional Objective	101.80 (39.52)	110.45 (38.47)	113.52 (41.58)
Instructional Synthesis	102.50 (40.07)	116.03 (35.77)	113.84 (37.04)
Instructional Evaluation	104.79 (42.11)	110.16 (40.84)	115.27 (46.16)

highest propensity for academic achievement and performance than the field-neutral and the field-dependent students. The field-dependent students, on the other hand, exhibited the higher propensity for course satisfaction than the field-independent students, who in turn have the higher propensity for course satisfaction than the field-neutral students. The same results were evident for the components of course satisfaction (Task Analysis [ANALYST], Instructional Objective [OBJECTIVE], Instructional Synthesis [SYNTHESIS], and Evaluation [EVALUATE]). These results point to three dimensions: (1) There is no evidence of instructor effect in the students' academic performance (F [1, 139] = , p> 0.5). (2) Female students achieved and performed

more, academically, than their male counterparts; but male students have higher overall mean course satisfaction than female students. (3) Female and field-dependent students are more computer anxious than male and field-independent students. The field-neutral students are more clustered around the moderate computer anxiety.

Correlation Analysis

The correlations between the computer anxiety scale and the computer attitude scale, computer anxiety and teaching effectiveness scale, and computer attitude and teaching effectiveness scale were 0.026, 0.061, and 0.027. These coefficients indicated that these instruments are independent, unrelated, and measured different constructs. Correlation analyses were performed to determine the strength of the relationships among the dependent variables academic achievement, academic performance, and course satisfaction. Students academic achievement and performance are related; and both are marginally related to students' course satisfaction. The components of students' course satisfaction are unrelated to students' academic achievement; but are marginally related to students' academic performance. These are summarized in Table 5.

The Product Limit Pearson's correlations revealed that: (1) The computer anxiety and attitude scales are independent and, both assessed different constructs. (2) Course satisfaction is more related to students' academic performance than it is to their academic achievement. That is, the Teacher Effectiveness and Evaluation Survey is more related to the criterion-referenced test than to cumulative GPA. (3) Task analysis (ANALYST) and instructional Synthesis

Table 5

Pearson's Correlations among Academic Achievement, Academic Performance, and Course Satisfaction (and its Components)

	1	2	3	4	5	6	7
CUMGPA [1]	1.000						
PERFORM [2]	.562	1.000					
SATISFY [3]	.056	.135	1.000				
ANALYST [4]	.108	.145	.920	1.000			
OBJECTIVE [5]	.027	.101	.956	.869	1.000		
SYNTHESIS [6]	.031	.140	.965	.859	.900	1.000	
EVALUATE [7]	.069	.129	.964	.858	.901	.887	1.000

Note.
CUMGPA = Students' Academic Achievement (College cumulative GPA)
PERFORM = Students' Academic Performance (Criterion Test Score)
SATISFY = Students' Course Satisfaction Score (TEES)
ANALYST = Task Analysis (Component of TEES)
OBJECTIVE = Instructional Objective (Component of TEES)
SYNTHESIS = Instructional Synthesis (Component of TEES)
EVALUATE = Instructional Evaluation (Component of TEES)
**** p-value < 0.001, *** p-value < 0.01, ** p-value < 0.05, and * p-value < 0.10

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(SYNTHESIS) are more related to students' academic performance than instructional objective (OBJECTIVE) and instructional evaluation (EVALUATE). These results are consistent with Ogunyemi and Ikegulu's (1998) and Ikegulu and Barham's (1999) studies.

Hypotheses Testing

These hypotheses tested the differential effects of students' gender, cognitive learning styles, and computer anxiety on their academic achievement (cumulative GPA) and academic performance (criterion-referenced test scores). Tables 6 and 7 provide comparative summary of the ANOVA results for the fixed factor effects on the outcome variables. From Table 6, the proposed model is significant (F [18, 122] = 362.5, $p < 0.01$). None of the interaction effects are significant at the five percent level of significance. Students' level of cognitive learning styles was the only significant (F [2, 122] = 33.69, $p < 0.01$) main effect. In addition, the main effects due to gender (F [1, 122] = 0.53, $p > 0.4$) and computer anxiety-apprehension (F [2, 122] = 2.23, $p > 0.1$) were insignificant. These results are consistent with those in Tables 5 and 7. Thus, students' cognitive learning styles is a significant factor and, is directly related to students' academic achievement and performance.

H_{01}: **There is no statistically significant difference in the academic achievements and performance of students' classified as field-dependent, field-neutral, and field-independent learners.**

This hypothesis tested the significant (main effect) due to cognitive learning styles on students' academic achievement and performance. From Tables 5, 6, and 7, cognitive learning styles is a significant factor in students' academic achievement and performance. Therefore, this

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hypothesis rejected.

Table 6

Comparative Summary of the ANOVA Results for Students' Academic Achievement

Source	SS	df	MS	F	p-value	Eta
Model	1145.947	18	63.664	362.496	0.000	0.982
Gender	0.093	1	0.093	0.531	0.468	0.004
Style	11.835	2	5.981	33.694	0.000	0.356
Anxiety	0.784	2	0.392	2.230	0.112	0.035
Gender-Style	0.065	2	0.033	0.185	0.831	0.003
Gender-Anxiety	0.111	2	0.055	0.316	0.730	0.005
Style-Anxiety	1.169	4	0.292	1.665	0.163	0.052
Gender-Style-Anxiety	0.681	4	0.170	0.969	0.427	0.031
Error	21.426	122	0.176			
Total	1167.373	140				

Note.
Gender = Participants' gender main effect.
Style = Main effects due to participants' cognitive learning styles
Anxiety = Main effects due to participants' computer anxiety (apprehension).
Gender-Style = Gender-by-cognitive learning styles interaction effect.
Gender-Anxiety = Gender-by-computer anxiety (apprehension) interaction effect.
Style-Anxiety = Computer anxiety-cognitive learning styles interaction effect.
Gender-Style-Anxiety = Gender-by-cognitive learning styles-by-computer anxiety interaction effect.
Eta = Effect size.

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Table 7

Comparative Summary of the ANOVA Results for Students' Academic Performance

Source	SS	df	MS	F	p-value	Eta
Model	822725.90	18	45706.96	645.575	0.000	0.990
Gender	4.394	1	4.394	0.062	0.804	0.001
Style	11403.864	2	5701.932	80.535	0.000	0.569
Anxiety	65.695	2	32.845	0.464	0.630	0.008
Gender-Style	91.183	2	45.592	0.644	0.527	0.010
Gender-Anxiety	15.738	2	7.869	0.111	0.895	0.002
Style-Anxiety	285.014	4	71.254	1.006	0.407	0.032
Gender-Style-Anxiety	91.788	4	22.947	0.324	0.861	0.011
Error	8637.647	122	70.800			
Total	831363.0	140				

Note.
Gender = Participants' gender main effect.
Style = Main effects due to participants' cognitive learning styles
Anxiety = Main effects due to participants' computer anxiety (apprehension).
Gender-Style = Gender-by-cognitive learning styles interaction effect.
Gender-Anxiety = Gender-by-computer anxiety (apprehension) interaction effect.
Style-Anxiety = Computer anxiety-cognitive learning styles interaction effect.
Gender-Style-Anxiety = Gender-by-cognitive learning styles-by-computer anxiety interaction effect.
Eta = Effect size.

H_{02}:. **There is no significant main effect between male and female students' academic achievement and performance.**

This hypothesis tested the significant (main effect) due to gender on students' academic achievement and performance. From Tables 6 and 7, gender is not a significant factor for students' academic achievement and performance. Therefore, this hypothesis is accepted.

H_{03}: **There are no significant main effects in students' academic achievement and performance with respect to their levels of computer anxiety.**

This hypothesis tested the significant (main effect) due to the computer anxiety (and apprehension) on students' academic achievement and performance. From Tables 6 and 7, there is no evidence to reject this hypothesis.

H_{04}: **There are no significant interaction effects among students' gender, cognitive learning styles, and computer anxiety with respect to their academic achievement and performance.**

This hypothesis tested the significant interaction effects due to gender, cognitive learning styles, and computer anxiety (and apprehension) on students' academic achievement and performance. Results from Tables 6 and 7 indicated non significant interaction effects among these three factors. Therefore, I failed to reject this hypothesis.

Summary and Conclusion

As the twentieth century draws to a close and the computer industry matures, awareness that the human computer interface is a key element in computer-based instruction (CBI) designs is finally occurring. This awakening has been caused by a variety of factors predicated upon the

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effects of screen design in CBI environments. The combined voices of frustrated users, fed up with complicated procedures and incomprehensive screens, have finally become overwhelming. Examples of "good" screen designs, when and if they did occur, have been presented as vivid proof that good design is possible (Brown, 1988; Mathews & Mertins, 1987, 1988). The extent to which these graphic displays and windowing techniques have affected students' academic achievement and performance in non computer courses have not been studied.

Students' Academic Achievement

The estimated overall marginal mean (standard deviation [SD]) of students' academic achievement (college cumulative GPA) was 2.89 (0.06). The estimated marginal means (SD) for the main effects were as follows: (1) Gender, male (Mean = 2.85, SD = 0.08) and female (Mean = 2.93, SD = 0.08); computer anxiety, Low (Mean = 3.07, SD = 0.12), Moderate (Men = 2.80, SD = 0.04), and High (Mean = 2.80, SD = 0.11); and cognitive learning styles, Field-dependent (Mean = 2.42, SD = 0.10), Field-neutral (Mean = 2.66, SD = 0.07), and Field-independent (Mean = 3.59, SD = 0.11).

A higher mean scores on the computer anxiety-apprehension scale indicated that the students were in agreement that the 'truth' about the item in question reflected their perceived level of computer anxiety (apprehension). In addition to the results of the hypotheses testing, Figures 1, 2, and 3 indicated non significant interaction effects among the three fixed factor effects. Female students had higher marginal means for academic achievement, were less likely to exhibit lower computer anxiety, and be less satisfied with their course than male students.

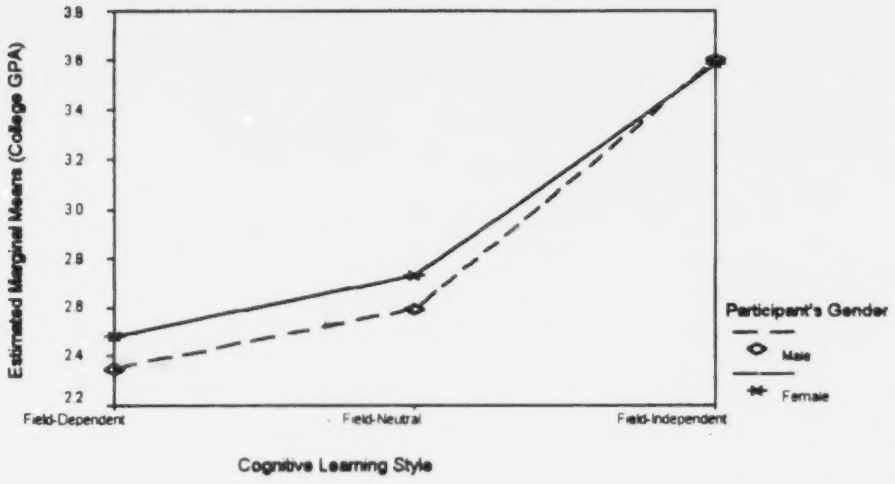

Figure 1:

Differential Effects of Gender and Cognitive Learning Styles on Academic Achievement

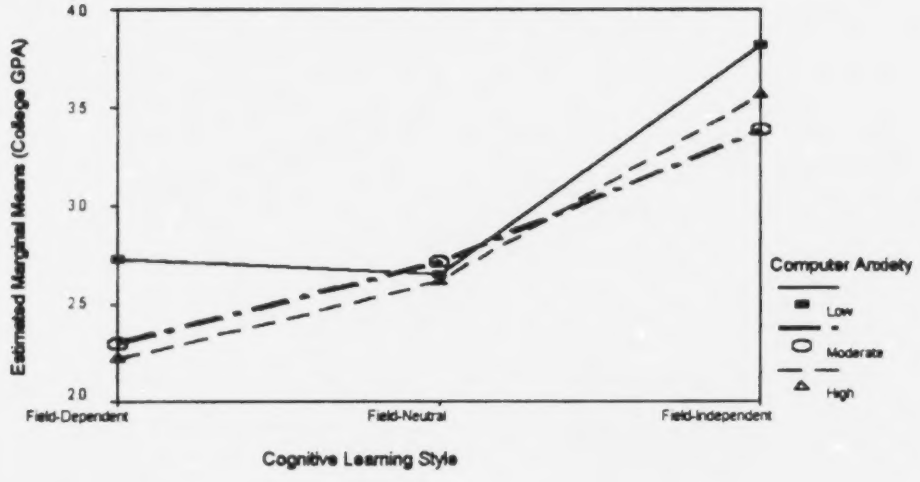

Figure 2:

Differential Effects of Computer Anxiety and Cognitive Learning Styles on Academic Achievement

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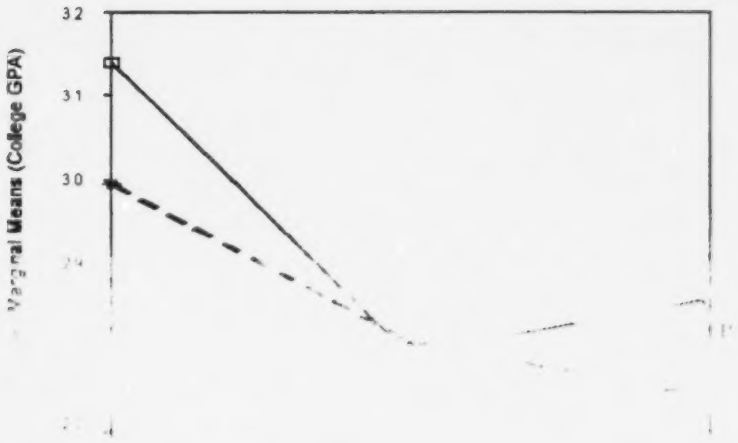

Figure 3:

Differential Effects of Gender and Computer Anxiety on Academic Achievement

Field-independent students have high mean academic performance (test scores); and are more likely to be satisfied than field-neutral and field-dependent students. The majority of the sample were clustered within the field-neutral and moderate computer anxiety categories. None of the students at the low computer attitude group is field-dependent; and none of the students at the high computer attitude group is field-independent. Therefore, there is no possibility of the computer anxiety by computer attitude, gender by computer anxiety by computer attitude, cognitive learning styles by computer anxiety by computer attitude, cognitive learning styles by computer anxiety (and by computer attitude), and gender by cognitive learning styles interaction effects.

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Students' Academic Performance

The estimated overall marginal mean (SD) of students' academic performance (criterion-reference test scores) was 75.56 (1.13). The estimated marginal means (SD) for the main effects were as follows: (1) Gender, male (Mean = 75.28, SD = 1.59) and female (Mean = 75.84, SD = 1.60); computer anxiety, Low (Mean = 77.28, SD = 2.41), Moderate (Mean = 74.98, SD = 0.87), and High (Mean = 74.42, SD = 2.10); and cognitive learning styles, Field-dependent (Mean = 55.0, SD = 2.98), Field-neutral (Mean = 78.91, SD = 1.41), and Field-independent (Mean = 92.77, SD = 2.26).

Supplement to the results of the hypotheses testing, Figures 4, 5, and 6 also indicated non significant interactions among the three fixed factor effects. Female (Mean = 75.84, SD = 1.60) students performed about the same as male (Mean = 75.28, SD = 1.59) students, were less likely to exhibit lower computer anxiety, and be less satisfied with their course than male students. Field-independent students had the highest estimated marginal means for academic performance; and were more likely to be satisfied with their course than the field-neutral and the field-dependent students. The majority of the sample were also clustered around the field-neutral and moderate computer anxiety categories. None of the students at the low computer attitude group was field-dependent; and none of the students at the high computer attitude group was field-independent. Therefore, there is no possibility of the computer anxiety by computer attitude, gender by computer anxiety by computer attitude, cognitive learning styles by computer anxiety by computer attitude, cognitive learning styles by computer anxiety (and by computer attitude), and gender by cognitive learning styles interaction effects.

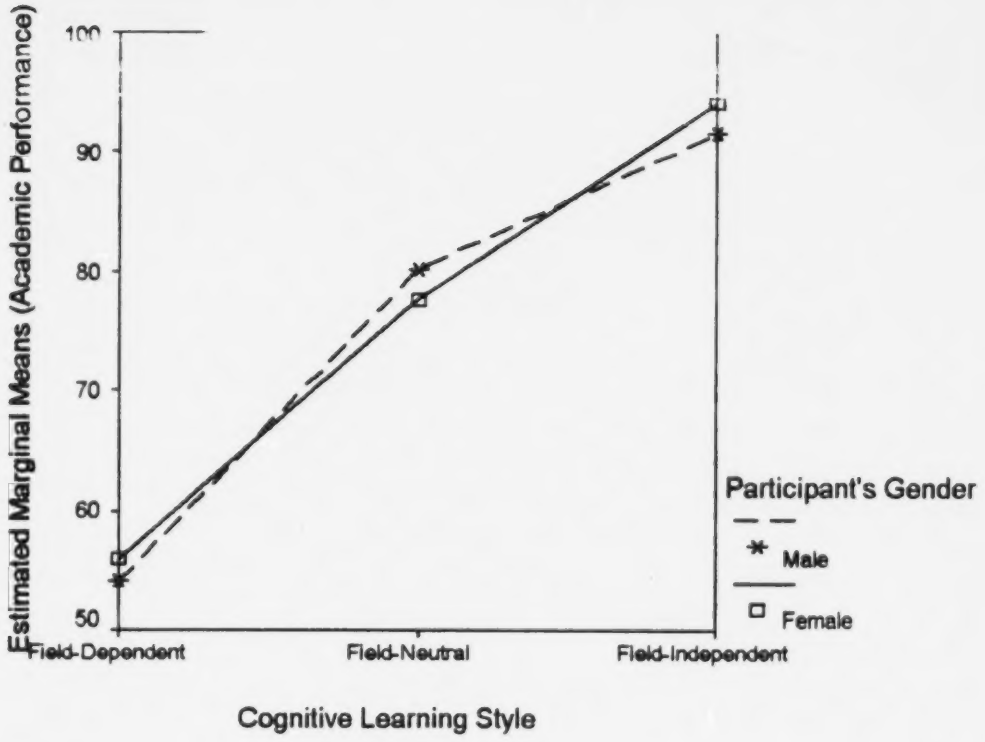

Figure 4:

Differential Effects of Gender and Cognitive Learning Styles on Academic Performance

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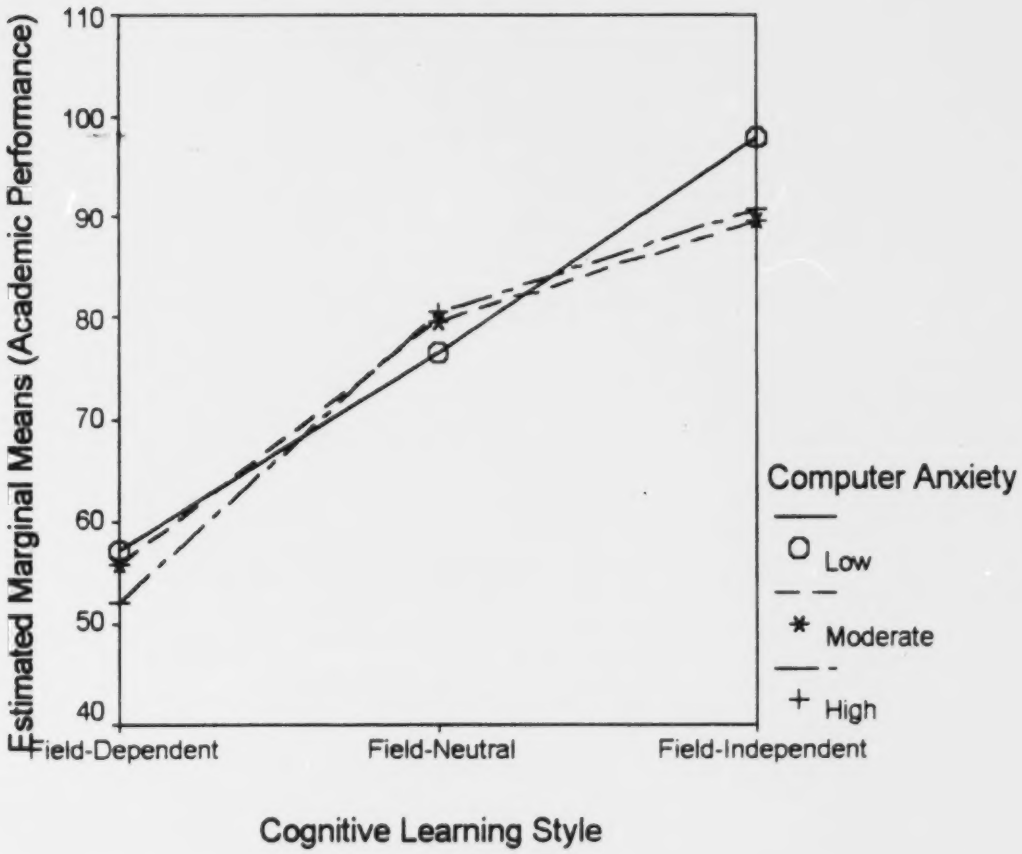
Estimated Marginal Means (Academic Performance)
110
100
90
80
70
60
50
40
Field-Dependent
Field-Neutral
Field-Independent
Cognitive Learning Style
Computer Anxiety
Low
Moderate
High

Figure 5:

Differential Effects of Gender and Computer Anxiety on Academic Performance

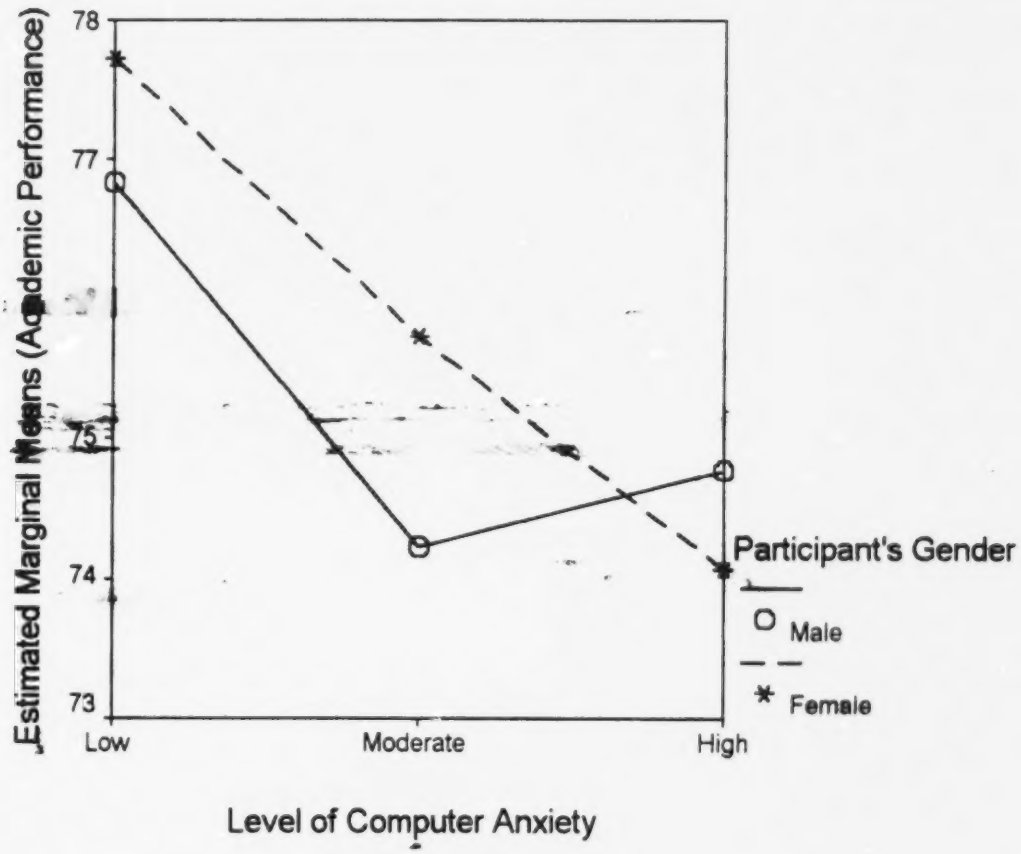

Figure 6:

Differential Effects of Gender and Computer Anxiety on Academic Performance

Results of this study corroborated the findings of similar studies under traditional educational conditions (Griffin & Franklin, 1996; Witkin, 1977; Witkin, et al., 1962, 1975).

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There was no significant gender effect on students' academic achievement and performance. Field-independent students outperformed both the field-neutral and field-dependent students. It is, however, unlikely that students with low computer anxiety (apprehension) achieved more, academically and, outperformed those with moderate and high computer anxiety (apprehension.

Furthermore, it is also interesting to note that the descriptive relationships investigated in this study indicated only 140 students who were not randomly assigned to the three levels of cognitive learning styles and computer anxiety, the proportions of these students within these levels did not pose any significant threats to the findings. The clustering of students within the field-neutral and moderate cognitive learning styles and computer anxiety categories respectively, suggested that Witkin's (1977) original proposal that there are only two levels of cognitive styles was insufficient. The large amounts of variances in academic achievement (98.2%) and academic performance (99%) accounted for in this study reveal the importance of these findings.

The results of this pilot study supply essential, heretofore missing, information in the field of cognitive-style learning anc computer anxiety. The unique learning environment established by the developmental and/or special education settings provides an excellent situation in which to investigate students' learning outcomes. Longitudinal or quasi-experimental studies are needed to portray the long-term effects of cognitive gains of such a positive experiential learning for students with moderate-to-severe learning disorders, computer anxiety (and apprehension), and filed-dependent learners.

Research studies that focused on the effectiveness of CBI screen designs included their benefits and limitations as well as human constraints in designing effective computer-based

instruction (Ikegulu, 1998; Ikegulu & Ikegulu, 1999). Graphics have revolutionized screen design and the user interface. A graphical screen bears scant resemblance to its text-based colleagues. Whereas a traditional screen maintains a one-dimensional, text-oriented, form-like quality, graphic screens can assume a three-dimensional look (Brown, 1988; Kearsley, 1988). Information can "float" in windows (small rectangular boxes seeming to rise above the background plane (Galitz, 1992). Windows can also float above other windows. Information can appear and disappear, as needed, and in some cases texts can be replaced by symbols representing objects or actions. These symbols are commonly referred to as "icons" (Engel & Granda, 1975; Brown, 1988; Galitz, 1992). Graphics and human characteristics are some of the effective features of screen design. Computer anxiety, apprehension, and attitude have been attributed to the human characteristics, variations in graphic designs, and windowing platform. Nonetheless, the revolution of computers in education and industry has perpetuated increasing use of computers and the more recent World Wide Web and Internet-based computer technology (Davis, 1999, Ikegulu, 1998; Ikegulu & Ikegulu, 1999).

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Appendix A

Human Subjects Consent Form
[Grambling State University]

CODE #: _____

I, _____, attest with my signature that I have read and understand the
[Participant's Name: Last, First, & Middle Initials]
description of the study. I understand that my participation in this investigation is strictly voluntary and that my refusal to participate will not affect my relationship with my college. Further, I understand that I may withdraw at any time or refuse to answer any of the questions without reprisal. I also understand that the findings of this study will be confidential, accessible only to the principal investigator(s), myself, or a legally appointed representative on my behalf.

DESCRIPTION OF THE STUDY

Purpose: The objectives of this study are: (1) to utilize the CAIN, ACT and TEES that assess computer anxiety and attitude and, course satisfaction among traditional and nontraditional college-bound students; (2) to investigate the impact of perceived students' computer anxiety and attitude on their academic achievement and course satisfaction; and (3) to investigate the differential effects of gender (male & female), computer anxiety (low, moderate, and high), and computer attitude (low and high) on adult learners' academic achievement and course satisfaction.

Procedure: Data for this study will be collected at OHS (pilot site) using the MAAS and the Academic Majors and Occupational Preference (AMOP) Survey. Permission to conduct the study will be requested. Upon the approval of this study by the OHS's Human Subjects Committee, other institutions will be solicited for participation. Results of the pilot study will determine the scope, sampling enumeration, and sample size for the large-scale investigation.

Risks: There will be no risks to potential participants in this study. There are no right or wrong answers in the surveys. The participants will be required to respond to the items on he instrument as accurately as possible. The findings of the study will not affect the participants' grades or their relationship with their parent (or adopted) institution(s).

Benefits: No compensation (monetary or otherwise) will be provided to the participants.

Confidentiality: All materials will be kept strictly confidential. The information provided by the participants will not become a part of their institutional records. No one will be allowed to view the completed surveys except the investigators and any competent authority(ies) appointed by the participant.

_____
[Participant's Signature and Date]

For further information, questions, or matters relating to this study and the participants' rights, please contact the following:

Andrea M. Davis, Principal Investigator
(DREADAVIS@AOL.COM)
Monroe, LA 71202
(318) 329-2901

APPENDIX B

CODE #: _____

Student's Demographic/Biographic Information

Age: _____ *OR* Date of Birth: ____/____/____ (Month/Day/Year)

Gender: [1] Male [2] Female

Classification (Grade Level):
[1] Freshman [2] Sophomore [3] Junior [4] Senior

Ethnicity/Race: [1] White (Non-Hispanic) [2] Black (Non-Hispanic)
[3] Asian American [4] Hispanic American
[5] Indian/Native American [6] Others

High School GPA: _____

List all MATH and ENGLISH Course Taken in **HIGH SCHOOL**:

MATH: _____ **ENGLISH**: _____
_____ _____
_____ _____
_____ _____

My **American College Test** (ACT) and/or **Scholastic Aptitude Test** (SAT) Composite score(s):

[ ] COMPOSITE **ACT** SCORE: [ ] COMPOSITE **SAT** SCORE:

[1]	9 or Less	[1]	460 or Less
[2]	10 - 13	[2]	470 - 520
[3]	14 - 16	[3]	530 - 620
[4]	17 - 19	[4]	630 - 770
[5]	20 - 23	[5]	780 - 930
[6]	24 - 26	[6]	940 - 1050
[7]	27 - 29 or More	[7]	1060 - 1190 or More

Family Background:

I am from a (Check One) _____ family system
[1] Single family (natural parent, mother or father)
[2] Two family (mother & father, adopted parents, Uncle/Aunt. Etc.)
[3] Two family (step-parents, God parents, etc.)

Number of people (including your parents) in your immediate family _____
Number of Brothers _____ Number of Sisters _____

How many of your siblings are in or attended college?
Number of Brothers _____ Number of Sisters _____

Davis' (1999) Computer Anxiety-Apprehension and Attitude Survey (CAAAS)

DIRECTIONS:
Below are a series of statements about mathematics. There are no right or wrong answers to these statements. Please think about each statement by itself and answer with the number of the response that truly applies to you, and not what you would like to be true. While some of these statements may seem repetitious, take your time, try to be as 'honest' as possible, and indicate the degree to which each statement applies to you by circling (o) whether you:

[1] Strongly Agree, [2] Agree, [3] Uncertain or Unsure, [4] Disagree, or [5] Strongly Disagree.

1. Having a computer available to me would improve my productivity	[1]	[2]	[3]	[4]	[5]
2. Using computer would save me some time and work	[1]	[2]	[3]	[4]	[5]
3. If I used a computer, I could get a better picture and figures	[1]	[2]	[3]	[4]	[5]
4. I would be satisfied to have a computer available for my use	[1]	[2]	[3]	[4]	[5]
5. Having to use a computer could make my life less enjoyable	[1]	[2]	[3]	[4]	[5]
6. A lot of things would be easier if I have a computer available	[1]	[2]	[3]	[4]	[5]
7. I feel very negative about computers in general	[1]	[2]	[3]	[4]	[5]
8. Having a computer available could make things more fun for me	[1]	[2]	[3]	[4]	[5]
9. If I had a computer at my disposal, I would try to get rid of it	[1]	[2]	[3]	[4]	[5]
10. I looked forward to a time when computers are more widely used	[1]	[2]	[3]	[4]	[5]
11. I doubt if I would ever use computers very much	[1]	[2]	[3]	[4]	[5]
12. I avoid using computers whenever I can	[1]	[2]	[3]	[4]	[5]
13. I enjoy using computers	[1]	[2]	[3]	[4]	[5]
14. I feel that there are too many computers around now	[1]	[2]	[3]	[4]	[5]
15.Computers are probably going to be an important part of my life	[1]	[2]	[3]	[4]	[5]
16.A computer could make learning fun	[1]	[2]	[3]	[4]	[5]
17. I will get a lot of satisfaction from using a computer .	[1]	[2]	[3]	[4]	[5]
18. It would be more trouble than its worth using a computer	[1]	[2]	[3]	[4]	[5]
19. I am usually uncomfortable when I have to use a computer	[1]	[2]	[3]	[4]	[5]
20. I sometimes get nervous just thinking about computers	[1]	[2]	[3]	[4]	[5]
21. I will probably never learn how to use a computer	[1]	[2]	[3]	[4]	[5]
22. Computers are too complicated to be of much use to me	[1]	[2]	[3]	[4]	[5]
23. I would be very unhappy using computers all the time	[1]	[2]	[3]	[4]	[5]
24. I sometimes feel intimidated using a computer	[1]	[2]	[3]	[4]	[5]
25. I sometimes feel that computers are smarter than I am	[1]	[2]	[3]	[4]	[5]
26. I can think of many ways that I can use a computer	[1]	[2]	[3]	[4]	[5]

27. Computer do not scare me at all	[1]	[2]	[3]	[4]	[5]
28. I would like working with computers	[1]	[2]	[3]	[4]	[5]
29. Working with a computer would make me very nervous	[1]	[2]	[3]	[4]	[5]
30. I do not feel threatened when others talk about computers	[1]	[2]	[3]	[4]	[5]
31. It wouldn't bother me at all to take computer courses	[1]	[2]	[3]	[4]	[5]
32. I'm no good with computers	[1]	[2]	[3]	[4]	[5]
33. Using computers to solve problems does not appeal to me	[1]	[2]	[3]	[4]	[5]
34. Computers make me feel uncomfortable	[1]	[2]	[3]	[4]	[5]
35. Generally, I will feel OK trying a new problem on the computer	[1]	[2]	[3]	[4]	[5]
36. I would feel at ease in computer class	[1]	[2]	[3]	[4]	[5]
37. Working with computers would be enjoyable and stimulating	[1]	[2]	[3]	[4]	[5]
38. I don't think I would enjoy doing advanced computer work	[1]	[2]	[3]	[4]	[5]
39. Figuring out computer problems does not appeal to me	[1]	[2]	[3]	[4]	[5]
40. I get a sinking feeling when I think of trying to use a computer	[1]	[2]	[3]	[4]	[5]
41.I am sure I could do work with computers	[1]	[2]	[3]	[4]	[5]
42. I would feel comfortable working with a computers	[1]	[2]	[3]	[4]	[5]
43. When there is a problem with a computer run that I cannot immediately solve, I would stick with it until I have the answer	[1]	[2]	[3]	[4]	[5]
44. I am not the type to do well with computers	[1]	[2]	[3]	[4]	[5]
45. I I don't understand how some people can spend so much time working with computers and seem to enjoy it	[1]	[2]	[3]	[4]	[5]
46. I am sure I could learn a computer language	[1]	[2]	[3]	[4]	[5]
47. Once I start to work with a computer, I find it hard to stop	[1]	[2]	[3]	[4]	[5]
48. I think using a computer would be very hard for me	[1]	[2]	[3]	[4]	[5]
49. I will do as little work with computers as possible	[1]	[2]	[3]	[4]	[5]
50. Computers make me feel unease and confused	[1]	[2]	[3]	[4]	[5]
51. If a problem is left unsolved in a computer class, I would Continue to think about it afterward	[1]	[2]	[3]	[4]	[5]
52. I could get good grades in computer courses	[1]	[2]	[3]	[4]	[5]
53. I do not enjoy talking with others about computers	[1]	[2]	[3]	[4]	[5]
54. I do not think I could handle a computer course	[1]	[2]	[3]	[4]	[5]
55. I am self-confident when it comes to working with computers	[1]	[2]	[3]	[4]	[5]

TEACHER EFFECTIVENESS & EVALUATION SURVEY (TEES, Ogunyemi & Ikegulu, 1998)

DIRECTIONS:
Please think about each statement and answer with the number of the response that truly applies to you, and not what you would like to be true or what you think others would want to hear. Think about each statement by itself. Write the number of the response which agrees with your perception toward the statement in the blank space to the far right hand corner. Thank you for your honest and objective response. Use the following options:

[1] Almost Always True [2] Often True [3] Generally True [4] Occasionally True [5] Almost Never True

_____1. Instructor determines the abilities, background, need, and attitudes of students.
_____2. Instructor determines goals based on curriculum.
_____3. Instructor breaks down goals into learning tasks.
_____4. Instructor determines minimum skills required of students to complete the course.
_____5. Instructor determines the course content in order to organize the curriculum.
_____6. The content of the syllabus is adequate and relevant.
_____7. The course objectives are clearly stated.
_____8. Students' course expectations are clearly stated.
_____9. Instructor identifies important points in the course.
_____10. The purpose of the course is clearly stated.
_____11. The prerequisites to the course are outlined.
_____12. The corerequisites to the course are clearly stated.
_____13. Lectures are relevant to the course objectives.
_____14. Instructor has a clear understanding of the course/subject.
_____15. Instructor has an effective style of presentation.
_____16. Instructor speaks audibly and clearly.
_____17. Instructor explains course materials clearly.
_____18. Instructor displays enthusiasm when teaching.
_____19. Instructor uses examples and illustrations during lectures.
_____20. Class lectures contain current information.
_____21. Class size is adequate for in-class interaction.
_____22. There is enough time for questions and discussions.
_____23. Instructor matches students' abilities with lectures.
_____24. Course builds on concepts, procedures, and principles.
_____25. Course assignments are interesting and stimulating.
_____26. Instructor uses teaching aids for this course.
_____27. The current lesson is related to previous lessons.
_____28. Instructor provides immediate feedbacks to students.
_____29. Assignments, exams, & projects are clearly explained.
_____30. Instructor's class appearance is appropriate.
_____31. The instructor is qualified to teach the course.
_____32. The required textbook is relevant to the course.
_____33. Students are free to ask questions in the class.
_____34. Students participate in classroom discussions.
_____35. Instructor respects individual students in the class.
_____36. The instructor motivates students to do their best work
_____37. Quizzes and exams are relevant to the course materials.
_____38. Instructor assigned grades fairly and impartially.
_____39. Classroom is accessible to all students.
_____40. The instructor is warm and friendly with students
_____41. The instructor cares about students in the class.

BEST COPY AVAILABLE